SACRAMENTO FIRE WEATHER
2012 ANNUAL SUMMARY

Narrative

Almost 717,000 acres burned in the Northern California Geographic Area Coordination Center (ONCC) area of responsibility, excluding Hawaii. This far surpassed the nearly 23,000 and 34,000 acres burned in 2011 and 2010, respectively. The NWS Sacramento forecast area incorporates the interior portion of the ONCC. Therefore, just over 260,000 areas burned in NWS Sacramento's forecast area during 2012, which accounted for 36 percent of the nearly 717,000 acre total. This was, by far, the most active fire season since the lightning outbreak of 2008.

Unlike epic snowfall that besieged most basins during the winter of 2010-2011, the opposite was true for the 2011-2012 winter snowpack. The year began abnormally dry with well below average precipitation through February. January started off the year with a rather strong northeast wind event across the west slope of the Sierra Nevada that actually resulted in some small wildfires in the Mother Lode. NWS Sacramento issued rare Fire Weather Watches and Red Flag Warnings for this time of year. Then for a second straight year, interior northern California received above average precipitation in March, and this year it carried into April. Several cold frontal passages brought some cool, wet weather for portions of May and June. However, above normal temperatures dominated interior northern California much of the timeframe between storm systems.

July through September, on average, recorded above normal temperatures. While July is typically the hottest month, August and September were particularly warm with much of the two-month period above normal. Some periods registered temperatures 5 to 15 degrees above normal. Fuels dried rapidly in August and were near or at critical levels by mid-month. The conditions worsened to the point that the Northern California Predictive Services Unit issued a "Fuels and Fire Behavior Advisory" with a "potential for extreme fire behavior due to critically low live and deal fuel moistures, very dry conditions resulting from minimal snowpack/winter precipitation, and elevated fire danger rating values across much of Northern California."

During most summers at least one lightning outbreak impacts interior northern California. This year three separate monsoonal moisture intrusions triggered lightning outbreaks. In prior years, NWS Sacramento issued Red Flags for dry thunderstorms based on rainfall parameter guidelines of < 0.05" in grass and <0.15" in dense stands of timber. This year NWS Sacramento amended the criteria for issuing Red Flag Warnings for thunderstorms/lightning based on abundant lightning (scattered thunderstorm coverage or greater) in conjunction with sufficiently dry fuels (fuels remain dry or critically dry during and immediately following a lightning event), and less on precipitation amount. Thunderstorm forecasts must have areal coverage of at least 25%. Warnings may be issued for isolated events (<25% areal coverage) when little or no precipitation is expected to reach the ground.

The first event occurred in late July that brought almost 1000 lightning strikes across much of the west slope of the Sierra Nevada from the Tahoe National Forest and the CALFIRE Nevada-Placer-Yuba Unit down through the Stanislaus National Forest and the Tuolumne-Calaveras

Unit. The second lightning event occurred less than two weeks later in early August. This event was forecast well in advance and was expected to cover much of the mountainous terrain from southern California up into Oregon. Even though an abundance of lightning stretched from southern California, into extreme western Nevada and through western Oregon; most of the lightning strikes bypassed interior northern California. Only a few strikes occurred in NWS Sacramento's forecast area. The last big event came in early September when the "Fuels and Fire Behavior Advisory" was in effect. Around 2,000 strikes landed from the Mount Diablo area northeast into the El Dorado National Forest. By far, the majority the strikes landed on the CALFIRE Tuolumne-Calaveras and the Amador-El Dorado units.

Later in September and into October, several Red Flags were issued for fairly short-lived north to northeast wind events. Wetting rains arrived in late October and with more wetting storms forecast on the horizon, most of our customers and surrounding offices decided to officially end high fire season. November and December provided a near record pace for seasonal precipitation and snowpack.

RED FLAG WARNING VERIFICATION FOR 2012

NWS Sacramento issued 57 individual zone based Red Flag Warnings, up from 17 in 2011. Since 2003, the average number of Red Flag Warnings issued per season stands at 46.7 (excluding the extreme season of 2008). If we include the 184 Red Flag Warnings from 2008, the average per season is 60.5. 2012 was the first year since 2008 that NWS Sacramento issued an above average number of Red Flag Warnings.

MONTH	FIRE WX WATCHES	RED FLAG WARNINGS	
		Wind / RH	Lightning
January	6	6	0
May	5	0	0
June	6	11	0
August	13	5	11
September	1	6	13
October	0	5	0

Red Flag Warning verification can be subjective, especially with regard to thunderstorms/lightning. NWS Sacramento verified 61% of all Red Flag Warnings issued in 2012. NWS Sacramento underestimated the abundance of thunderstorm/lightning activity in the first lightning event in July that equated to five missed Red Flag Warnings.

Statistically, Probability of Detection (POD) is the ratio of warned events to warned and unwarned events. So if:

A= the # of correct warnings
B= the number of incorrect warnings
C= the number of events not warned

Then POD = A / (A+C)
False Alarm Ratio (FAR) = B / (A+B)
Critical Success Index (CSI) = A / (A+B+C)

2012 Red Flag Warnings

	Wind/RH	Lightning	Total or Average
Red Flag Warnings	33	24	57
Correct Warnings	25	10	35
Incorrect Warnings	8	14	22
Missed Warnings	0	5	5
POD Red Flags	100%	66.7%	87.5%
CSI Red Flags	75.7%	52.6%	56.5%
FAR Red Flags	24.2%	58.3%	38.6%
Red Flags Lead Times	19.6 hours	11.0 hours	17.1 hours

2012 Fire Weather Watches

	Wind/RH	Lightning	Total or Average
Number of Fire Weather Watches	20	11	31
Number of Watches Verified	14	3	17
Lead time of verified Watches	32.1 hours	15.0 hours	28.8 hours

SPOT FORECASTS ISSUED FOR THE YEAR 2012

NWS Sacramento issued 527 spot forecasts last year with 226 for wildfires.

TYP	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SPOT	TMIN
PRE	23	26	7	11	38	59	14	1	13	39	61	6	298	39.0
WIL	6	0	2	0	3	12	48	87	59	9	0	0	226	36.1
WFU	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
SAR	0	0	1	0	0	0	0	0	0	0	0	0	1	15.0
HAZ	0	0	1	0	0	0	1	0	0	0	0	0	2	24.0
TES	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
TOT	29	26	11	11	41	71	63	88	72	48	61	6	527	36.6

INCIDENT METEOROLOGIST DISPATCHES FOR 2011

Incident Name	IMET	Dispatch Dates (Days)	Fire Weather District
Ozena Fire	Mike Smith	6/17-6/18 (2)	Oxnard, CA
Little Sand Fire	Jason Clapp	6/25-7/7 (13)	Grand Junction, CO
Mill Fire	Mike Smith	7/9-7/19 (11)	Sacramento, CA
Robbers Fire	Jason Clapp	7/13-7/20 (8)	Sacramento, CA
Penn and Graham Fires	Mike Smith	7/26-7/28 (3)	Sacramento, CA
Salt Creek Fire	Jason Clapp	8/2-8/6 (5)	Sacramento, CA
Ramsey Fire	Jason Clapp	8/15-8/20 (6)	Sacramento, CA
North Pass Fire	Jason Clapp	8/21-9/4 (15)	Eureka, CA
Stafford Fire	Mike Smith	9/6-9/13 (8)	Eureka, CA

IMET	Number of Days Deployed on Incidents
Jason Clapp	47
Mike Smith	24
Total NWS Sacramento IMET Deployed Days	71

FIRE WEATHER TRAINING ASSIGNMENTS IN 2012

The training courses taught and/or attended, locations, agency served and instructors follow:

Course Name Taught	**Location**	**Date**	**Agency Served**	**Instructor**
Wildland Fire Calc S-390	Magalia	1/17	CALFIRE	Mike Smith
Basic Fire Behavior S-290	McClellan	1/24-1/25	USFS	Jason Clapp
Basic Fire Behavior S-290	McClellan	1/31-2/1	USFS	Mike Smith
Rx300	McClellan	1/31	USFS	Mike Smith
Adv Wldnd Fire Calc S-490	McClellan	2/7-2/8	Various	Mike Smith
Basic Fire Behavior S-290	Sonora	2/14-2/15	USFS	Mike Smith
Basic Fire Behavior S-290	Mather	2/27-2/28	Various	Jason Clapp
Wildland Fire Calc S-390	Vacaville	3/5-3/6	Various	Mike Smith
Adv Fire Behavior S-590	Tucson	3/12-3/23	Various	Mike Smith
Basic Fire Behavior S-290	Garden Valley	3/21-3/22	Various	Jason Clapp
Wildland Fire Calc S-390	Auburn	4/2-4/3	CALFIRE	Mike Smith
Basic Fire Behavior S-290	Cameron Park	4/17-4/18	CALFIRE	Jason Clapp
Adv Wldnd Fire Calc S-490	Ione	4/17-4/18	CALFIRE	Mike Smith
Wildland Fire Calc S-390	Sonora	4/23-4/24	CALFIRE	Mike Smith
Wildland Fire Calc S-390	Sacramento	4/30-5/1	Various	Mike Smith
Weather Refresher	Pollock Pines	5/17	Various	Mike Smith
Weather Refresher	Pollock Pines	5/23	USFS	Mike Smith
Weather Refresher	Amador RD	5/23	USFS	Mike Smith
Basic Fire Behavior S-290	Sacramento	6/4-6/5	Various	Mike Smith
Wildland Fire Calc S-390	McClellan	10/23-10/24	USFS	Mike Smith
Course Name Attended	**Location**	**Date**	**Agncy Sponsor**	**Student**
IMET Workshop	Virtual	3/26-3/30	NWS	Mike/Jason
Training Instructor 1A	Sierra College	10/1-10/5	CALFIRE	Jason Clapp
Training Instructor 1B	Sierra College	11/26-11/30	CALFIRE	Jason Clapp